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ABSTRACT

Recently, young children have been allowed to testify as competent witnesses in courts of law and the testimony of a single child can be very important in sexual abuse cases. A study was conducted to examine the accuracy of nursery school children's eyewitness accounts in a naturalistic setting. Nursery school students (N=31) viewed two women, one white and one black, present a puppet show. Four days later, the children were asked to identify the two women, each from a three-person line-up. Nineteen white children and one Asian child agreed to complete the identification task. In trials in which the children picked someone out of the line-up, 50% of the total responses were correct; children correctly identified the white adult 60% of the time and the black adult 40% of the time. When no response was scored as lack of recognition, the rate of accuracy dropped to 32.3% overall, 39% for white adults, and 26% for black adults. Older children (over the median age of 49 months) were found to be better than younger children at identifying both the black and the white adults. These findings suggest that, under the conditions of the study, young children have difficulty identifying strangers they have seen 4 days earlier. Future research should assess recall abilities of young children in different situations. (NB)

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CHILDREN'S EYEWITNESS MEMORY FOR SAME AND DIFFERENT RACIAL MODELS

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In the past decade there have been a growing number of developmental psychologists conducting research in naturalistic settings. While the reasons responsible for this shift to more ecologically valid settings are many, a principal one appears to be a desire to verify in real-world settings models of cognitive development that were derived solely on the basis of laboratory experiments (Ceci & Bronfenbrenner, in press). Nowhere is this ecological trend more apparent than in the area of memory development. Developmental researchers have begun to examine such aspects of prospective memory as children's remembering to take vitamins, to keep appointments, to bring items to school, and even to take cupcakes out of the oven at specified times (e.g., Ceci & Bronfenbrenner, in press; Kreutzer, Leonard & Flavell, 1975; Meacham & Columbo, 1980).

However, there is one aspect of children's memory in naturalistic settings that has received very little attention so far; namely, eyewitness accounts of their earlier observations. This is an especially interesting topic given that recently young children have been allowed to testify as competent witnesses in courts of law. For example, in January, 1983, a 36 year old woman was convicted of first-degree murder and 12 counts of felony child abuse. The only eyewitnesses to the murder were the other children at the day care center that she operated.

Nineteen youngsters were permitted to testify against her in a California court (Beach, 1983).

In September, 1983, a 2 year old girl gave what police called "significant" and "productive" information concerning the intruders who had sexually assaulted her and killed her parents and older brother (Ithaca Journal, 1983).

The testimony of a single child is especially important in sexual abuse cases.[1] Last month, the New York State Assembly passed legislation that would repeal corroboration requirements for minors testifying to acts of non-forcible sexual abuse. State Attorney General Robert Abrams, testifying in support of the bill, argued, "Since relatively few offenders are caught in the act, there are no witnesses in the vast majority of cases" (Ithaca Journal, March 29, 1984). Abrams' testimony was supported by a 1982 study conducted by the New York State Department of Social Services. They reviewed 145 cases of alleged child sexual abuse and found that in only two of those cases was the offender found guilty as charged. The majority of cases that were criminally prosecuted were dismissed because of a lack of corroborating evidence.

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[1] The National Center on Child Abuse and Neglect estimate that there are at least 90,000 incidences of child sexual abuse annually in this country.

More and more young children are being called upon to testify. However, little is known about the factors that might influence young children's accuracy in eyewitness testimony. In contrast, there has been much research dealing with adult eyewitness memory (see Loftus, 1979; 1983; McCloskey & Egeth, 1983). Loftus (1979) argues that many factors can influence the accuracy of eyewitness memory. One of these factors is race. People are generally better at recognizing faces of persons of their own race than of a different race. Several studies have found support for the existence of an "own-race bias." Malpass and Kravitz (1969) tested students at the University of Illinois, a predominantly white university, and at Howard University, a predominantly black university. They found that white students at both universities were better able to identify photographs of white faces than of black faces. Black students at both universities were better able to identify black faces than their white classmates were.

Brigham and Barkowitz (1978) also using a college sample, found that black and white students were more accurate in identifying own-race photographs. Contrary to their expectations, racial attitudes and amount of experience with members of another race were not related to cross-racial identification accuracy.

To test whether or not the own-race bias holds true for segments of the population other than college students, Brigham and Williamson (1979), using the same photographs used by Brigham and Barkowitz, tested a group of elderly people (mean age = 72) in a Florida community. They found that the level of recognition accuracy for the elderly subjects was lower than the level of accuracy for the college age subjects. Like the college students, however, black subjects did significantly better at identifying pictures of blacks than pictures of whites and whites did significantly better with white pictures than did the blacks. Thus, the findings for adults have been fairly consistent; adults are better at own-race facial recognition than at cross-racial recognition.

Is the same pattern of results found for children? Feinman and Entwisle (1976) studied facial recognition in children in the Baltimore school system. Seventy-two students were tested from grades 1, 2, 3, and 6 for a total sample of 288 students. The children were shown 20 photographs and a short time later were asked to identify the 20 photographs from a group of 40 photographs.

Feinman and Entwisle found that recognition ability increased with the age of the subjects. Facial recognition accuracy improved markedly from ages 6 to 8. although the eleven year olds outperformed the younger students, the increase in recognition accuracy was not as

great between the third and the sixth grade as it was between the first and third grades. Using the same task they also found that the ability of college students was about the same as that of the sixth graders (77% correct vs. 75%).

Feinman and Entwisle found that children of both races recognized pictures of their own race better than pictures of the other race. Furthermore, blacks were better at recognizing white faces than whites were at recognizing black faces.

Based on these studies one could conclude: (1) that there is a curvilinear relationship between age and facial recognition accuracy. Very young children and elderly adults were less accurate in facial recognition tasks than older children and college adults. (2) Regardless of age, subjects are more likely to correctly identify same race photographs than other-race photographs.

All of the studies reviewed thus far have utilized a photograph to photograph paradigm. Loftus (1979) argues that there is a great difference between viewing photographs in an experimental laboratory and viewing a criminal during a real life incident. In order to assess eyewitness memory accuracy in a naturalistic setting, Brigham and his colleagues (1982) conducted a study involving 73 convenience store clerks from the Tallahassee area. Sixty-four of the clerks were white and 9 were

black. Convenience stores were chosen because they were the most likely to be robbed of all the area businesses. Consequently, their clerks were often called upon to identify suspects.

The experimenters had a black customer and a white customer each interact with the clerk separately for 3 to 4 minutes. In keeping with ethical guidelines, the customer interacted with the clerk in such a manner as to make it likely that the clerk would remember the customer without creating an overly stressful situation for the non-voluntary subject. For instance, one customer would buy a pack of cigarettes and pay for the cigarettes with pennies while apologizing for not having any other cash. The customer would then ask for directions to a distant spot, such as an airport, to encourage eye contact. The second customer would enter the store five minutes later to purchase a small item. When he reached the cashier, he discovered that he didn't have enough money to buy the object. After fumbling through his pockets, the customer finally came up with enough money and then he too asked for directions.

Two hours later, students posing as "law interns" asked the clerk to carefully examine six photographs of blacks assembled by the police department and six photographs of whites also assembled by the police department. The clerk was asked whether or not he had seen any of the men in the

photographs during the last 24 hours. Each set of photographs included the respective black and white customer.

The overall rate of accurate identification was 34.2% (chance level = 16.7%).[2] Omitting cases where no identification was attempted, identifications were correct 46.8% of the time.

In cases where identification was attempted, black clerks were correct 65.2% of the time and white clerks were correct 39.9% of the time. When a "no response" category was included in the analyses, white clerks were equally likely to be accurate in identification of the white customers (31.3%) and of the black customers (32.3%). The black clerks correctly identified the white customer 44.5% of the time and the black customer 55.6% of the time.[3] Thus in this naturalistic study the evidence for own-race bias is tenuous. The small number of black clerks were more likely to correctly identify the black customer than the white customer but they were also more likely to correctly identify the white customer than were the white clerks. The researchers considered the

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[2] In a pilot study, subjects were asked to identify the customers 24 hours after they had been in the store and the rate of accurate identification was no better than chance.

[3] Given the small sample of black subjects, this percentage difference can be misleading; the black clerks apparently correctly identified five black customers and four white customers.

possibility that the black clerks worked in high risk stores and therefore might be more vigilant. However, a check with police records indicated that clerks who worked in stores that had been robbed were not more likely than other clerks to accurately identify the customers.

Dent and Stephenson (in press) have examined factors influencing the reliability of 11 and 12 year old children's eyewitness memory in naturalistic settings. They reported that one week after seeing a workman in a classroom for about 2 minutes, 12% of the children made accurate identifications from a 9 man line-up. In contrast, 29% made correct identifications from color slides of the men in the line-up. However, there was no difference in the number of incorrect identifications between the two groups. In a second experiment, in which a man was introduced to the children by the teacher and either told jokes and threw candy to the children or read a story to them for approximately 5 minutes, 82% of the children correctly identified the man from a line-up. Dent and Stephenson suggested that since a follow-up experiment reduced the initial exposure time of the man to the children to 2 minutes, but did not reduce the level of accuracy by very much, that the difference in percentage of correct identifications was probably due to the fact that the teacher introduced the children to the man and thereby drew their attention to him.

The present study was undertaken to assess the accuracy of nursery school children's eyewitness reports in a naturalistic setting. Children viewed two adults, one white and one black, present a puppet show. Four days later they were asked to identify the two adults, each from a three-person line-up. The data of interest in this presentation are children's recognition accuracy as a function of their age and the race of the adult models.

Subjects. Thirty-one nursery school children (17 boys, 14 girls) were tested for eyewitness memory accuracy. Of the 31 subjects, 10 (4 boys, 6 girls) were unwilling to identify the adult models in the testing situation. Twenty of the children who completed the identification task were white; one was Asian. All of the children attended a university operated nursery school; 14 in the morning session (mean age = 46.2 months) and 17 in the afternoon session (mean age = 49.9 months).

Procedure. The children were told a children's story about a frog and a toad. A black woman and a white woman presented the story in full view of the children with hand puppets. For the morning session, the black woman was the frog and the white woman was the toad. In the afternoon session, different black and white women did the presentation and their roles were reversed. The story was presented under optimal conditions for eyewitness recall

(i.e., there was good illumination and the children were seated in close proximity to the adult targets). The presentation of the story took about 3 minutes and the adults were "on-stage" for approximately 5 minutes. Furthermore, the adults were introduced to the children by the preschool teacher.

Four days after the story presentation, each child was brought into a room in which 3 black women and 3 white women were seated on the floor. The child was asked to choose the black woman who had told the story and then to choose the white woman who had told the story. The positions of the target persons in the "line-ups" were changed after each trial. In the morning session, the 3 white women were to the child's left and the 3 black women were on the right. In the afternoon, these positions were reversed. The children were questioned by a familiar female adult.

Results. In the trials in which the children picked somebody out of the three person line-up, 50% of their responses were correct. However, if no response is scored as lack of recognition, the overall rate of accuracy drops to 32.3% (not significantly different from chance = 33%). (See Table 1.)

Children correctly identified the white adult 60% of the time, when no responses are excluded; 39% of the time, when no responses are coded as incorrect. With respect to

the black adult, 40% of the responses were correct, when no responses are excluded; 26% of the responses were correct, when no responses are scored as incorrect.

To examine the effect of age on accuracy, children above and below the median age (Median = 49 months) were compared (see Table 2). Excluding no responses, the older children correctly identified the adult models 2/3 of the time. The younger children correctly identified the adult models 1/3 of the time -- in other words, at chance level. A chi-square test was calculated on the raw frequencies for 2 ages (older vs. younger) X 2 levels of accuracy (correct vs. incorrect). Older subjects (mean age = 53 months) were significantly better than younger subjects (mean age = 44 months) at overall accuracy; chi-square (1 d.f.) = 4.91, $p<.05$. Moreover, this finding was confirmed with signal detection analysis.

The older children were better at identifying both the white and the black adults. Excluding no responses, older children correctly identified the white adult 73% of the time and the black adult 60% of the time. In contrast, younger children correctly identified the white and black adults 44% and 20% of the time respectively. Moreover, older children outperformed younger children regardless of whether they were in the morning or afternoon session.

Discussion. Given the fact that increasingly preschool children are being called upon to provide eyewitness

accounts to police officers during pretrial investigations and in the courts, this study was designed to assess the eyewitness memory capabilities of these young children. Overall, the children in this study correctly identified the adult models on 50% of the trials in which the child was willing to identify someone in the line-up. If non-responses are treated as incorrect responses, the percentage of correct responses falls to about chance level. Individuals differed greatly in their ability to identify the adult models. Some children without hesitation correctly identified both the black and the white adults. Other children seemed to guess randomly or were unwilling to hazard a guess.

The obvious question is how relevant are these findings to judicial proceedings? The experiment was designed to be as ecologically valid as possible within the constraints of ethical guidelines. However, ethical standards precluded the use of an experimental situation in which the child would be subjected to unnecessary stress. Obviously, in many judicial proceedings, children are not asked to identify adults they have seen performing innocuous acts. Furthermore, the children were asked to identify the adults four days after seeing them. It is possible that the results of this study would be quite different if the children had been asked to identify the models four hours (or four months) after the hand puppet

show. Therefore this study should be viewed as an initial attempt at ascertaining the eyewitness memory recall abilities of preschool children rather than as a definitive statement on their abilities.

A comparison between older and younger preschool children yielded results that are consistent with other research that older children can correctly identify adult models better than younger children can. When the sample was divided at the median age, and the results for younger and older children were compared, older children clearly outperformed their younger classmates. This finding is consistent with previous research (Feinman & Entwisle, 1976) which demonstrated a positive relationship between age and facial recognition ability in a sample of elementary school children.

Finally, in this study, the children correctly identified the white adult model in 60% of the trials in which an identification was attempted. The comparable figure for the black model was 40%. Although this finding is consistent with the majority of studies that have looked at cross-racial identification, a note of caution is in order. The preschoolers in the afternoon session correctly identified the black adult almost as often as they correctly identified the white adult (7 correct versus 8 correct respectively). The morning preschoolers were less accurate in identifying the black adult than in

identifying the white adult. Different target adults and different line-ups were used in the morning and afternoon sessions; using different people in the morning and afternoon sessions was necessary to accommodate the undergraduates who volunteered to help with the study. Since the black/white difference was found only in one session, it is possible that the line-ups were not functionally equivalent (i.e., the distractors may have resembled the target person more in one line-up than in the other). We intend to assess more definitively in a follow-up study whether or not preschoolers, like adults, can identify own-race faces better than other-race faces.

In summary, this study suggests that under the conditions used in this experiment, three and four year olds have difficulty identifying strangers they have seen four days earlier. However, four year olds were generally better at this eyewitness memory task than were the three year olds. The children in this study, nearly all of whom were white, were more likely to remember the white adult than the black adult, although the difference was not statistically significant.

Because one would expect young children's ability to remember strangers to differ under various circumstances (e.g. length of exposure to the target, latency period between seeing the adult and being asked to identify the adult, how stressful the situation is, etc.), we would

suggest that more research be conducted to assess the recall abilities of young children in differing situations. We would also suggest that more research be conducted in two related areas. First, in addition to assessing the ability of preschoolers to remember strangers, more research is needed to understand the ability of preschoolers to accurately recall the details of events. Secondly, psychologists could examine the conditions that aid young children in their attempts to provide useful testimony. For instance, are preschoolers better able to identify a suspect from a line-up or from a series of photographs? What style of questioning helps the child to recall events or a sequence of events most accurately? Given the fact that increasingly preschoolers are being called upon to provide testimony in criminal prosecutions, a trend that is likely to continue, these issues concerning the eyewitness memory capabilities of preschoolers are likely to receive considerably more attention in the near future than they have thus far.

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APPENDIX

Table 1

Eyewitness Identification Accuracy for All Children

Overall Rate of Accuracy

Responses	N*	%	% correct/incorrect**
Correct	20	32	50
Incorrect	20	32	50
No answer	22	36	--
	62		

Accuracy Rate for Black Target

Responses	N*	%	% correct/incorrect**
Correct	8	26	40
Incorrect	12	39	60
No answer	11	35	--
	31		

Accuracy Rate for White Target

Responses	N*	%	% correct/incorrect**
Correct	12	39	60
Incorrect	8	26	40
No answer	11	35	--
	31		

*N = number of trials
**% correct/incorrect excludes no answer responses

Table 2

Eyewitness Identification Accuracy by Age

(Median Split)

	Responses	
Age	Correct	Incorrect
Older	14 (67%)	7 (33%)
Younger	6 (32%)	13 (68%)
Total	20	20

Chi-square (df=1) =4.91 $p < .05$